UTAH STATE IMPLEMENTATION PLAN

CONTROL MEASURES FOR AREA AND POINT SOURCES

OZONE

SECTION IX PART D

IX.D.1 Implementation Plan

IX.D.l.a Nonattainment Areas

In accordance with the requirements of Section 107, Clean Air Act as amended August 1977, the Wasatch Front Intrastate Air Quality Control Region comprised of Davis, Salt Lake, Utah, and Weber Counties was designated as a nonattainment area for ozone. On August 18, 1981 the EPA redesignated Utah and Weber Counties as attainment areas for ozone based on ambient air data collected by the state which demonstrated attainment of the ozone standard.

IX.D.1.b Ozone Concentrations and Data Analysis

(1) Concentrations

Ozone is not directly emitted, but results primarily from the interaction of hydrocarbons and oxides of nitrogen in the presence of sunlight. In 1980, the number of ozone monitoring sites in the Salt Lake/Davis County area was increased from two to six. Prior to l98l there had been very little monitoring of hydrocarbons in the Salt Lake/Davis County area. In the summer of l98l, two temporary hydrocarbon monitoring sites were established - one in downtown Salt Lake City and the other in southern Davis County in an area near several oil refineries.

During l98l the primary National Ambient Air Quality Standard for ozone was exceeded on thirteen separate days. Figure IX.D.1 shows the dates of exceedence, the locations, and the measured values for the years 1979, 1980, and 1981.

Figure IX.D.1*
EXCEEDENCES OF .l2 PPM OZONE STANDARD IN l98l

	Date	Day of Week	Site	Hour	Peak Value (ppm)
l.	July 22	Wed	B	l2-l3	.l63
			F	l2-l3	.l25
2.	July 28	Tue	B	l2-l3	.l55

* B = Bountiful C = Cottonwood
F = Farmington R = West Ranch
S = Salt Lake City

	Date	Day of Week	Site	Hour	Peak Value (ppm)
3.	July 4	Sat	S	l2-l3	.l47
4.	June 29	Mon	C	l5-l6	.l38
			S	l3-l4	.128
5.	June 30	Tue	R	l4-l5	.l35
			F	l4-l5	.l25
6.	May l	Fri	B	l3-l4	.l33
7.	July 5	Sun	F	l4-l5	.l32
			B	l4-l5	.l28
8.	Aug l8	Tue	B	l3-l4	.l3l
9.	July 2l	Tue	F	l3-l4	.l30
			B	l3-l4	.l28
l0.	July 23	Thur	B	l2-l4	.l25
ll.	July l6	Thur	F	l4-l5	.l25
l2.	July 9	Thur	F	ll-l2	.l25
l3.	Aug 5	Wed	F	l2-l3	.l25

EXCEEDENCES OF THE .12 PPM OZONE STANDARD IN 1980

l.	July 22	Tue	S	l2-l3	.l82
2.	Aug. ll	Mon	B	l3-l4	.l78
			F	l4-l5	.l62
3.	July l8	Fri	S	l3-l4	.l7l
4.	July l6	Wed	S	l4-l5	.l69
5.	July 28	Mon	B	l3-l4	.l64
			S	l4-l5	.l40
6.	June 28	Sat	S	l6-l7	.l55
7.	Sept. 5	Fri	S	l2-l3	.l46
			F	l5-l6	.l30
8.	June l7	Tue	S	l4-l5	.l46
9.	July 2l	Mon	S	l2-l3	.l45
l0.	Aug. 8	Fri	S	l5-l6	.l36
ll.	July 30	Wed	S	l4-l5	.l25
l2.	June 9	Mon	S	l4-l5	.l25

EXCEEDENCES OF THE .12 PPM OZONE STANDARD IN 1979

l.	June 28	Thur	B	l4-l5	.l90
			S	l6-l7	.l49
2.	Sept. 5	Wed	B	l4-l5	.l54
			S	l6-l7	.l40

* B = Bountiful C = Cottonwood

To Be Deleted

F = Farmington R = West Ranch
S = Salt Lake City

	Date	Day of Week	Site	Hour	Peak Value (ppm)
3.	June 24	Sun	B	l4-l5	.l4l
4.	July 20	Fri	B	l3-l4	.l38
5.	Aug. 3	Fri	B	l2-l3	.l37
6.	Oct. l0	Wed	S	l4-l5	.l32
7.	July l6	Mon	S	l4-l5	.l32
			B	l3-l4	.l25
8.	Aug. l	Wed	B	l2-l3	.l3l
9.	July l5	Sun	B	l3-l4	.l29
l0.	Aug. 4	Sat	B	l2-l3	.l25
ll.	June l6	Sat	B	l5-l6	.l25

* B = Bountiful C = Cottonwood
F = Farmington R = West Ranch
S = Salt Lake City

(2) Data Analysis

Two different analytical approaches were used in an effort to define the extent of the ozone problem and to predict the hydrocarbon emission reduction necessary to attain the ozone standard. The city specific EKMA procedure developed by EPA was applied using locally developed emissions inventories, meteorological parameters, and hydrocarbon (HC) / oxides of nitrogen (NO_x) data. This method predicted that a 29% reduction in l980 hydrocarbon emissions is necessary to achieve the ozone standard.

In the second method, a determination was made of the meteorological conditions which contribute to high ozone formation in the Salt Lake/Davis County area. A linear relationship was observed between the hydrocarbon concentrations measured during the morning hours and peak ozone concentrations measured in the afternoon on days in which meteorological conditions conducive to ozone formation existed. This method predicted that a 32% reduction in l98l hydrocarbon emissions is necessary to achieve the ozone standard.

The reduction requirements predicted by both methods are consistent with hydrocarbon reduction requirements predicted in other states where ozone problems similar to Utah's exist. The technical support document for this section of the SIP contains the details of the analysis and a summary of an informal survey of the hydrocarbon reduction requirements necessary in other states.

IX.D.1.c Emission Inventories

In total, five HC/NO_x emission inventories were prepared. The inventories were based on control strategies currently being implemented and growth projection for both counties. The inventories include actual emissions of HC/NO_x in 1980 and projected emissions of HC/NO_x in 1987. The inventories are designed to represent HC/NO_x emissions typical of a summer weekday. The five inventories which were prepared are as follows:

1) Salt Lake/Davis County Combined HC/NO_x Inventory (Figure IX.D.2).
2) Salt Lake County HC/NO_x Inventory (Figure IX.D.3).
3) Davis County HC/NO_x Inventory (Figure IX.D.4).
4) Salt Lake City Urban Core Inventory (Figure IX.D.5).
5) Petroleum Refinery, Storage, and Distribution Inventory (Figure IX.D.6).

The Salt Lake City Urban Core and the Petroleum Refinery Storage and Distribution Inventories were determined by the state to be most appropriate for use in development of this SIP.

A growth rate equivalent to 1% in the Urban Core was used in development of this SIP. No growth was predicted for the petroleum refinery area (see technical support document for growth rate rationales).

IX.D.1.d. Control Strategy

During the development of the 1979 SIP, a thorough review was made of all Control Techniques Guidance documents (CTG) developed for EPA. Those strategies contained in the CTG which were determined by the Utah Air Conservation Committee to be applicable were adopted. As Group III CTG Documents are made available from EPA, they will be reviewed and adopted in the state as the Air Conservation Committee determines appropriate. Reasonably Available Control Technology requirements were applied to all point sources and are currently being implemented. Application of these strategies will reduce hydrocarbon emissions to levels necessary to meet the NAAQS for ozone by November 1, 1985. The following is a list of applicable mobile and point source control strategies:

- Federal Motor Vehicle Control Program (FMVCP)
- Automobile Inspection and Maintenance (I/M)
- Transportation Control Measures (TCM)
- Reasonably Available Control Technology (RACT)

The FMVCP, I/M, and TCM were described in Section IX.C.4. In terms of hydrocarbon reductions, these strategies will achieve the following by 1984:

> FMVCP - Under this program, as the older vehicles are replaced by newer vehicles with better controls, the emissions per vehicle mile will be reduced from 5.59 gms to 3.50 gms which represents a 37.4% reduction from l980 to l984. This program will reduce emissions in the urban core by 25.3%.
>
> TCM - Reductions due to transit improvements are included in the FMVCP reductions. Urban core HC emissions will be reduced by 0.2% with the implementation of the

TCM developed by the Wasatch Front Regional Council in their document "Traffic Control Measures for the Wasatch Front Region" in January, 1982 which is summarized in Section XI, Appendix 2.

I/M - Under the authority granted them by Sections 41-6-163.(5) and (6), Salt Lake and Davis Counties have developed implementation schedules and enforcement procedures for I/M programs in their counties. Both programs are designed to reduce automobile HC emissions by 25%. Salt Lake County's regulations are contained in Section X, Appendix 7. Davis County's ordinance is contained in Section X, Appendix 6. Both I/M programs will be fully implemented by April 1, 1984, and are predicted to reduce urban core emissions by 4.3%.

Figure IX.D.2
SALT LAKE - DAVIS COUNTIES COMBINED
HYDROCARBON AND NOx EMISSIONS INVENTORY

	Hydrocarbons			NOx	
	1980	1987 No I/M	1987 I/M	1980	1987
	Kg/day	Kg/day	Kg/day	Kg/day	Kg/day
I. Local Data Collected					
A. Highway Vehicles	77,220	43,614	36,516	50,110	53,380
B. Major Point Sources	25,584	7,141	7,141	34,186	38,266
C. Aircraft	2,560	2,915	2,915	1,796	2,440
D. Gasoline distribution Losses	10,692	7,560	7,560	--	--
E. Railroads	651	651	651	2,567	2,567
F. Forest fires	1,966	1,966	1,966	329	329
G. Cutback Asphalt	245	--	--	--	--
H. Area Combustion Process Nat Gas	79	93	93	4,908	5,778
SUBTOTAL	118,998	63,940	56,842	93,896	102,760
II. Per Capita Emissions					
A. Commercial/Consumer Use	6,000				
B. Architectural Surface Coating	4,379				
C. Degreasing	2,857				
D. Automobile Refinishing	1,806				
E. Dry Cleaning	1,424				
F. Graphic Arts	763				
SUBTOTAL	17,229	17,229	17,229	--	--
III. Per Employee Estimates					
A. Furniture and Fixture Mfg.	623				
B. Rubber and Plastic Prod. Mfg	579				
C. Timber and Wood Products	412				
SUBTOTAL	1,614	1,614	1,614	--	--
IV. Apportionment of National Usage					

To Be Deleted

A. Construction Vehicles	1,151	1,361	1,361	15,980	18,912
B. Lawn and Garden Use	2,054	2,430	2,430	245	289
C. Industrial Vehicles	854	1,001	1,001	2,302	2,702
D. Off-Highway Motorcycles	118	140	140	7	9
E. Farm Use	128	107	107	271	230
SUBTOTAL	4,305	5,039	5,039	18,805	22,142
TOTAL	142,146	87,822	80,724	112,701	124,902
		- 38.2%	- 43.2%		+10.8%

Figure IX.D.3
SALT LAKE COUNTY HYDROCARBON AND NOx
EMISSIONS INVENTORY

	Hydrocarbons			NOx	
	1980	1987 No I/M	1987 I/M	1980	1987
	Kg/day	Kg/day	Kg/day	Kg/day	Kg/day
I. Local Data Collected					
A. Highway Vehicles	62,800	35,560	29,860	40,260	42,880
B. Major Point Sources	6,898	2,129	2,129	26,739	30,819
C. Aircraft	2,550	2,903	2,903	1,795	2,439
D. Gasoline distribution Losses	8,642	6,110	6,110	--	--
E. Railroads	416	416	416	1,641	1,641
F. Forest fires	1,629	1,629	1,629	274	274
G. Cutback Asphalt	194	--	--	--	--
H. Area Combustion Process Nat Gas	66	77	77	4,251	4,948
SUBTOTAL	83,195	48,824	43,124	74,960	83,001
II. Per Capita Emissions					
A. Commercial/Consumer Use	4,850				
B. Architectural Surface Coating	3,540				
C. Degreasing	2,310				
D. Automobile Refinishing	1,460				
E. Dry Cleaning	1,150				
F. Graphic Arts	617				
SUBTOTAL	13,927	13,927	13,927	--	--
III. Per Employee Estimates					
A. Furniture and Fixture Mfg.	503				
B. Rubber and Plastic Prod. Mfg	468				
C. Timber and Wood Products	333				

SUBTOTAL	1,304	1,304	1,304	--	--
IV. Apportionment of National Usage					
A. Construction Vehicles	929	1,081	1,001	12,900	15,020
B. Lawn and Garden Use	1,660	1,932	1,932	198	230
C. Industrial Vehicles	768	894	894	2,071	2,410
D. Off-Highway Motorcycles	90	105	105	5	6
E. Farm Use	92	79	79	208	181
SUBTOTAL	3,539	4,091	4,091	15,382	17,847
TOTAL	101,965	68,146	62,446	90,342	100,848
		-33.2%	-38.8%		+11.7%

Figure IX.D.4
DAVIS COUNTY HYDROCARBON AND NOx
EMISSIONS INVENTORY

	Hydrocarbons			NOx	
	1980	1987 No I/M	1987 I/M	1980	1987
	Kg/day	Kg/day	Kg/day	Kg/day	Kg/day
I. Local Data Collected					
A. Highway Vehicles	14,420	8,054	6,656	9,850	10,500
B. Major Point Sources	18,687	5,012	5,012	7,447	7,447
C. Aircraft	10	12	12	1	1
D. Gasoline distribution Losses	2,050	1,450	1,450	--	--
E. Railroads	235	235	235	926	926
F. Forest fires	337	337	337	55	55
G. Cutback Asphalt	51	--	--	--	--
H. Area Combustion Process Nat Gas	13	16	16	657	830
SUBTOTAL	35,803	15,116	13,718	18,936	19,759
II. Per Capita Emissions					
A. Commercial/Consumer Use	1,150				
B. Architectural Surface Coating	839				
C. Degreasing	547				
D. Automobile Refinishing	346				
E. Dry Cleaning	274				
F. Graphic Arts	146				
SUBTOTAL	3,302	3,302	3,302	--	--
III. Per Employee Estimates					
A. Furniture and Fixture Mfg.	120				
B. Rubber and Plastic Prod. Mfg	111				

C. Timber and Wood Products	79				
SUBTOTAL	310	310	310	--	--
IV. Apportionment of National Usage					
A. Construction Vehicles	222	280	280	3,080	3,892
B. Lawn and Garden Use	394	498	498	47	59
C. Industrial Vehicles	86	107	107	231	292
D. Off-Highway Motorcycles	28	35	35	2	3
E. Farm Use	36	28	28	63	49
SUBTOTAL	766	948	948	3,423	4,295
TOTAL	40,181	19,676	18,278	22,359	24,054
		- 51.0%	- 54.5%		+7.6%

Figure IX.D.5

SALT LAKE CITY URBAN CORE INVENTORY

	Hydrocarbons			NOx	
	1980	1987 No I/M	1987 I/M	1980	1987
	Kg/day	Kg/day	Kg/day	Kg/day	Kg/day
Highway Vehicles	19,610	9,027	7,580	12,390	13,400
Minor Point Sources	523		609	13,610	13,610
Gasoline Dist. Losses	2,276		1,609	--	--
Railroads	208		208	820	820
Cutback Asphalt	51		0	--	--
Area Combustion	17		17	4,251	4,251
Degreasers	608		346	--	--
Dry Cleaners	303		173	--	--
Per Capita Emissions	2,756		2,756	--	--
Per Employee Emissions	687		687	--	--
Construction Vehicles	247		285	3,400	3,950
Lawn and Garden	219		219	198	198
Industrial Vehicles	384		447	1,036	1,205
TOTAL	27,889	16,383	14,936	35,705	37,434
Percent Reduction		-41.3%	-46.4%		-4.8%

Figure IX.D.6

PETROLEUM REFINING, STORAGE, AND DISTRIBUTION INVENTORY

	Hydrocarbons (Kg/day)		NOx (Kg/day)	
	1980	1987	1980	1987
Phillips	5,734	854	1,833	1,833
Wesreco	1,860	361	472	472
Husky	1,992	690	549	549
Chevron	7,136	2,390	3,862	3,862
AMOCO	6,028	1,205	1,825	1,825
Caribou	525	77	68	68
Morrison	575	75	34	34
Pioneer	625	326	--	--
Bill roderick	75	35	--	--
Little America	95	77	--	--
Eko Tech	32	32	--	--
TOTALS	24,677	6,122	8,643	8,643
		-75.2%		0%

RACT requires the installation of effective emissions control technology on the major hydrocarbon point sources in the nonattainment area. This strategy will reduce urban core emissions by 4.4% and emissions from the petroleum refinery storage distribution area by 75.2%.

The following subsections describe the controls for which regulatory requirements have been adopted. Details of these strategies are found in the Utah Air Conservation Regulations.

IX.D.1.d(1) Control of Hydrocarbon Emissions in Refineries

Vacuum Producing Systems: Vacuum producing systems attendant to vacuum distillation and other refinery processes are potential sources of volatile organic compound emissions. VOC emissions to the atmosphere are prevented by venting the non-condensable vapors from the blowdown system into the refinery fuel system, a firebox, or incinerator.

Wastewater (Oil/Water Separators): Refinery wastewater drains and treatment facilities are a source of VOC emissions whenever wastewater is exposed to the atmosphere. VOC emissions to the atmosphere are reduced by collecting contaminated wastewater in a closed process drainage system and directing it to a covered oil separator.

Process Unit Turnaround: The procedure of unit shutdown for repair or inspection and the subsequent start-up is termed a unit turnaround. Purging the vapor contents of the vessels is done to provide a safe interior atmosphere for workers. The major potential source of VOC emissions during the purging process is the depressurization of the vessels. Atmospheric emissions of those vapors are reduced by venting emissions to a vapor recovery system, flare, or firebox.

Blowdown System: A refinery blowdown system provides for safe disposal of hydrocarbons (vapor and liquid) discharged from pressure relief devices. Emissions will be controlled by either 1) venting to a vapor recovery or disposal system or 2) the pressure relief valves will be protected by a rupture disk or maintained by an inspection system approved by the Executive Secretary.

Catalytic Cracking: Flue gas from catalytic cracker catalyst regeneration contains hydrocarbons which will be vented to a wasteheat boiler, a process heater, firebox, or be otherwise incinerated or controlled.

Leaks from Petroleum Refinery Equipment: Leaks from various types of refinery equipment such as pumps, compressors, and valves generate significant amounts of VOC emissions. The Utah Air Conservation Regulations require regular monitoring of equipment which is likely to have leaks and prompt repair of such leaks as they are found.

IX.D.1.d(2) Storage Tanks

The 1980 hydrocarbon inventory indicated significant emissions of HC due to storage of petroleum liquids in North Salt Lake and South Davis Counties. Control strategies are being implemented to control VOC emissions from storage tanks.

Control Strategy: VOC emissions from storage tanks is controlled by the installation of internal floating roofs for fixed roof tanks and secondary seals for external floating roof tanks.

Affected Facilities: It is necessary that owners/operators of fixed roof petroleum storage tanks with capacities greater than 40,000 gallons and with stored liquids having a vapor pressure greater than 1.52 psia apply floating roofs to such tanks.

The owners/operators of external floating roof welded tanks containing petroleum liquids having a true vapor pressure of 4.0 psia or greater, or external floating roof riveted tanks containing petroleum liquids having a true vapor pressure of 1.5 psia or greater are required to install secondary seals in all such tanks.

IX.D.1.d(3) Tank Truck Gasoline Loading Terminals and Bulk Plants

Tank truck terminals at the oil refineries in South Davis and North Salt Lake Counties are potential major stationary sources of hydrocarbon emissions. Hydrocarbon emissions occur at these terminals when vapors are displaced from tank transport facilities during loading and are vented directly into the atmosphere.

Bulk gasoline loading plants are secondary distribution facilities which receive gasoline from bulk terminals or refineries by trailer transport, store it in above ground storage tanks, and dispense it via account trucks to local farms, businesses, and service stations. At bulk plants, vapors are displaced to the atmosphere from the filling of account trucks and the storage tanks. Additional emissions from the storage tanks are attributed to breathing and storage losses and are addressed in IX.D.4.b.

Control Strategy: Emissions from gasoline terminals and bulk gasoline plants will be controlled by use of vapor balance systems where displaced vapors from account (delivery) trucks are transferred to the storage tanks and subsequently to the transport trucks that deliver gasoline to the bulk plant. Vapors from the transport truck will be collected at the gasoline terminal.

Affected Facilities: In order to control VOC from bulk gasoline plants it is necessary to apply vapor balance systems to storage tanks with an average throughput of l5,000 liters per day (3900 gallons). In order to be effective, the vapor balance system must have the following capabilities:

l) Control VOC displaced by gasoline delivery to the storage tanks (except for those existing storage tanks of less than 2000 gallons capacity), and
2) Control VOC displaced by filling account trucks.

In addition, the account trucks used in connection with the system must be capable of receiving displaced vapors from storage tanks when off- loading at service stations; and the account truck, laden with vapors would only be refilled at an installation equipped with a vapor recovery system or equivalent which recover at least 90% by weight of displaced VOC.

Proper maintenance and operation is required at bulk plants at all times to assure effective collection and vapor tight storage. Tanks and account trucks must be leak tested at least annually.

IX.D.1.d(4) Vapor Control Systems at Gasoline Stations

Hydrocarbon emissions from gasoline service station operations occur primarily when hydrocarbon vapors are displaced from the underground storage tanks during filling and when gasoline is dispensed to vehicle tanks. Regulations now require control during the transfer of fuel to the underground storage tanks.

Control Strategy: The proper use of simple balance systems will control greater than 90% of the hydrocarbon emissions from the filling of underground storage tanks. These systems control emissions from storage tanks during filling by returning displaced vapors to the tank truck.

Affected Facilities: Any stationary storage tank located at a gasoline dispensing facility with a capacity of 7,580 liters (2,000 gallons) or more is required to have installed:

A vapor return line such that vapors displaced from the storage tank during filling are returned to the delivery tank. Delivery tank operators are required to have a vapor return system installed on each delivery tank to insure all gasoline transfer to or from a delivery tank is done in such a manner that displaced vapors are not vented to the atmosphere during transfer operations. In addition, proper maintenance and operation are required to insure efficient collection and that there are no leaks in the system. Frequent visual inspections are required to insure proper operation of manifolding and relief valves. Tank trucks and storage tanks are to be maintained in vapor tight conditions with leak testing conducted at least annually on each tank.

Figure IX.D.7 lists the emissions predicted from the major HC source categories for which control requirements exist in the Utah Air Conservation Regulations.

Figure IX.D.7

	1980 (reported)	1983 (projected)	1984 (projected)
Refinery	12,693	3,339	2,094
Storage	5,271	3,147	1,023
Loading/Transfer	4,460	752	752
Uncontrolled Emissions	2,253	2,253	2,253
Total	24,677 Kg/day	9,411	6,122 Kg/day
		-61.5%	-75.2%

IX.D.1.d(5) Other Control Techniques

In addition to the strategies contained in Sections IX.D.1.d(1) - (4), several other guidance documents were reviewed in an effort to plan reductions of hydrocarbon emissions along the Wasatch Front. Specifically the following areas were reviewed: Control of volatile organic emissions (VOC) from (l) Surface coating of large appliances, (2) Surface coating for insulation of magnet wire, (3) Surface coating of metal furniture, and (4) Surface coating of cans, coils, paper, fabrics, automobiles, and light duty trucks. Although these processes are capable of sizeable VOC emissions, the hydrocarbon inventory indicates that their contribution to the ozone problem in the Wasatch Front is insignificant.

Control of Volatile Organic Compounds from the Use of Cutback Asphalt: Since l973-74 the State has adopted a policy to eliminate as much as possible the use of cutback asphalts and substitute emulsions in their place. In l975 the Federal Highway Administration adopted a similar policy and urged all states to comply.

There are still some applications where the use of emulsions do not give satisfactory results and cutback must be employed, primarily during the winter months. The following is a summary of the past and projected use of cutback asphalts and emulsions in the Wasatch Front by the Utah Department of Transportation:

	Emulsions	Cutback
Three Year Average (l975-l977)	l477 tons	l696 tons
l982	2000 tons	l200 tons
Anticipated in l987	2400 tons	400 tons

Regulations have been enacted which have reduced these projections. Emulsions are used almost exclusively in the nonattainment area.

Solvent Metal Cleaning: Volatile organic emissions occur when solvents are used during metal cleaning operations. Positive emission reductions are required through the use of proper operating practices and efficient control equipment, which include but are not limited to:

1) Covering degreasing equipment whenever possible.
2) Proper use of solvent sprays.
3) Various means of reducing the amount of solvent carried out of the degreaser on cleaned work.
4) Prompt repair of leaking equipment.
5) Proper disposal of wastes containing volatile organic solvent.

Effective control devices are required on all degreasing operations in the nonattainment area. The level of control for major sources is detailed by system B in EPA Publication 45/2-77-022 "Control of Volatile Organic Emissions from Solvent Metal Cleaning". Conveyorized degreasers smaller than 2.0 m^2 (approx. 2l.5 ft^2) of air/vapor interface would be exempted from the requirements of a major control device and open top vapor degreasers smaller than l m^2 (approx. l0.8 ft^2) of open area would be exempted from the application of refrigerated chillers (or carbon absorbers). Effective disposal of waste solvent would require storage in covered containers and disposal by a method which prevents its emission to the atmosphere.

Perchloroethylene Dry Cleaning Plants: Hydrocarbon emissions occur from leaks, waste disposal, and dryer exhausts. All dry cleaning plants are required to control leaks promptly and dispose of waste properly. In addition, the larger plants are required to install carbon adsorption technology or use some other technique capable of reducing emissions by at least 90% on their dryer exhausts.

Other Sources: Regulations have been enacted which restrict the emissions from other processes including:

Paper coating
Fabric and Vinyl coating
Metal furniture coating
Large appliance surface coating
Magnet wire coating
Flat wood coating
Miscellaneous metal parts coating
Graphic arts
Synthesized pharmaceutical manufacturing

The regulations implementing this section of the SIP are contained in Section R307-1-4.9 of the Utah Air Conservation Regulations. The emissions inventory shows that these sources are only minor constituents of the hydrocarbon emissions inventory (see Figure IX.D.8).

IX.D.1.e Demonstration of Attainment and Reasonable Further Progress

A demonstration of attainment based on data gathered during 1981 is made based on the linear HC-O_3 relationship because it is the only year with adequate ambient hydrocarbon data and the year with the most complete ozone data. The demonstration of attainment based on the EKMA procedure uses the last 3 years of ambient ozone data collected at Salt Lake City and Bountiful.

Linear Relationship

The highest ozone readings are associated with high hydrocarbon readings monitored in the urban core of Salt Lake City. The most significant reductions of hydrocarbons in this area are attributable to the gradual reduction in the 'hydrocarbons per vehicle mile' emission factor as a result of the FMVCP.

Figure IX.D.9 shows the estimated urban core emissions from 1980 through 1987 and the percent reduction from the 1980 and the l98l emissions inventories.

As indicated in Section IX.D.1.b the hydrocarbon reduction requirement for this area is 32%. Figure IX.D.9 shows the 1981 emission inventory as 25,706 Kg/day. Therefore, the inventory necessary for attainment is:

$$25,706 \, (1 - 0.32) = 17,480 \text{ Kg/day}$$

The estimated inventories for the years l98l through l987 are shown in Figure IX.D.10, which shows attainment of the ozone standards by November 1, 1985.

EKMA Modeling Approach: The EKMA approach required that the five highest days at each site in the last three years be modeled.

The fourth highest hydrocarbon reduction requirement at each site is the control requirement at that site. The highest of these site specific control requirements is the overall control requirement for the area.

The following are the site specific control requirements:

	Date	Peak O_3(PPM)	Control Requirement
Salt Lake:	6/28/80	0.l6	29%
Bountiful:	7/28/8l	0.l6	24%

Figure IX.D.8

1980 HYDROCARBON EMISSIONS INVENTORY

	SALT LAKE		DAVIS		COMBINED	
	Kg/day	%	Kg/day	%	Kg/day	%
I. Local Data Collected						
A. Highway Vehicles	62,800	61.6	14,420	35.9	77,220	54.3
B. Major Point Sources	6,898	6.8	18,687	46.5	25,585	18.0
C. Aircraft	2,550	2.5	10	-	2,560	1.8
D. Gasoline distribution Losses	8,642	8.5	2,050	5.1	10,692	7.5
E. Railroads	416	.4	235	.6	651	.5

F.	Forest fires	1,629	1.6	337	.8	1,966	1.4
G.	Cutback Asphalt	194	.2	51	.1	245	.2
H.	Area Combustion Process Nat Gas	66	.1	13	-	79	.1
	SUBTOTAL	83,195	81.6	35,803	89.1	118,998	83.5
II.	Per Capita Emissions						
A.	Commercial/Consumer Use	4,850	4.8	1,150	2.9	6,000	4.3
B.	Architectural Surface Coating	3,540	3.5	839	2.1	4,379	3.1
C.	Degreasing	2,310	2.3	547	1.4	2,857	2.0
D.	Automobile Refinishing	1,460	1.4	346	.9	1,806	1.3
E.	Dry Cleaning	1,150	1.1	274	.7	1,424	1.0
F.	Graphic Arts	617	.6	146	.4	763	.5
	SUBTOTAL	13,927	13.7	3,302	8.2	17,229	12.3
III.	Per Employee Estimates						
A.	Furniture and Fixture Mfg.	503	.5	120	.3	623	.4
B.	Rubber and Plastic Prod. Mfg	468	.5	111	.3	579	.4
C.	Timber and Wood Products	333	.3	79	.2	412	.3
	SUBTOTAL	1,304	1.3	310	.8	1,614	1.2
IV.	Apportionment of National Usage						
A.	Construction Vehicles	929	.9	222	.6	1,151	.8
B.	Lawn and Garden Use	1,660	1.6	394	1.0	2,054	1.5
C.	Industrial Vehicles	768	.7	86	.2	854	.6
D.	Off-Highway Motorcycles	90	.1	28	.1	118	.1
E.	Farm Use	92	.1	36	.1	128	.1
	SUBTOTAL	3,539	3.5	766	1.9	4,305	3.1
	TOTAL	101,965		40,181		142,146	

Since the Salt Lake control requirement is the more stringent, this value is used to estimate the overall attainment date.

As shown in Figure IX.D.9 the l980 inventory is 27,889 Kg/day; therefore, the attainment inventory is:

27,889 (l - .29) = l9,800 Kg/day

Figure IX.D.11 shows the July l, l980 inventory and the July 1, l984, inventory with and without the control strategies outlined in the SIP.

Figure IX.D.9
ESTIMATED URBAN CORE HC EMISSIONS (kg/day)

	1980	1981	1982	1983	1984	1987
Highway vehicles (tran. incl.)	19,610	17,400	15,700	14,000	12,600	9,027
Highway vehicles (with TCM)	19,610	17,400	15,660	13,951	12,552	8,986
Highway vehicles (with TCM and I/M)					12,277	7,539
Uncontrolled Point Source	523	534	546	558	570	609
Gasoline Dist. Loses	2,276	2,276	1,609	1,609	1,609	1,609
Degreasers	608	621	635	318	324	346
Cut Back Asphalt	51	34	17	0	0	0
Dry Cleaners	303	310	316	158	162	173
Construction Vehicles	247	252	258	264	269	285
Industrial Vehicles	384	392	401	410	419	447
Other Sources	3,887	3,887	3,887	3,887	3,887	3,887
Totals	27,889	25,706	23,329	21,155	19,792	16,342
Percent Reduction from l980		-7.8	-l6.4	-24.l	-29.0	-4l.4
Percent Reductions from l98l			-9.2	-17.7	-23.0	-36.4

To Be Deleted

With I/M	19,517	14,895
Percent Reductions from l980	-30.0	-46.66
Percent Reductions from l98l	-24.1	-42.10

Figure IX.D.10

To Be Deleted

Figure IX.D.11
(values are in kg/day of non-methane hydrocarbons)

	No Controls July 1 1980	No Controls July 1 1984	Control Strategies	July 1 1984
Highway Vehicles	l9,6l0	20,406	FMVCP, TCM, I/M	12,277
Gasoline Dist.	2,276	2,276	RACT	1,609
Cutback Asphalt	5l	51	RACT	0
Degreasing	608	663	RACT	324
Dry Cleaning	303	330	RACT	162
Minor Point Source	523	583		570
Construction Vehicle.	247	275		269
Industrial Vehicle.	384	428		419
Sources	3,887	3,887		3,887
Totals	27,889	28,87l		19,517

Figure IX.D.12 shows the attainment inventory and the estimated annual inventories from l980 to l987. As this figure shows, the estimated attainment date is May 1, 1984.

Since the EKMA approach has been approved by EPA, this date is, from the EPA's standpoint, the one that should be used for planning purposes. However, because the EKMA model is not designed for use in areas with complex terrain such as those found in the Utah ozone nonattainment area, the State does not agree with the use of EKMA to demonstrate attainment as part of the Utah SIP planning process. It is the position of the State that the alternate approach of attainment demonstration described in this SIP is appropriate for use in Utah.

This SIP shows that by applying the FMVCP, I/M, and TCMs to mobile sources and RACT to point and area sources in the nonattainment areas, attainment of the ozone standard can be achieved within the deadline established in the Clean Air Act.

To Be Deleted

Figure IX.D.12